

# Alaska's 2011 Air Monitoring Network Plan

## Appendices and Glossary



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## Table of Contents

<i>Appendix A:</i> .....	<i>1</i>
Designations.....	1
<i>Appendix B:</i> .....	<i>1</i>
Siting Criteria.....	1
Carbon Monoxide Sites.....	1
Particulate Matter (PM <sub>10</sub> and PM <sub>2.5</sub> ) Sites.....	2
<i>APPENDIX C:</i> .....	<i>1</i>
Network Site Summary.....	1
<i>Appendix D:</i> .....	<i>1</i>
Glossary.....	1

## APPENDIX A:

### *Designations*

**Non-attainment:** any area that does not meet, or that contributes to poor ambient air quality in a nearby area that does not meet, the national primary or secondary ambient air quality standard for any pollutant on the national ambient air quality standards list.

**Attainment:** any area that meets the national primary or secondary ambient air quality standard for the pollutant.

**Unclassifiable:** any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

**Maintenance:** any area that is going through the transition from being designated a non-attainment area to attainment.

Note: Further information regarding designation can be found at:

<http://epa.gov/air/oaqps/greenbk/define.html>

<http://www.epa.gov/air/caa/>

## APPENDIX B:

### *Siting Criteria*

The Federal Environmental Protection Agency (EPA) Region 10 requested that the Alaska Department of Environmental Conservation (DEC) staff provide a table which demonstrates that each monitoring site complies with siting criteria identified in 40 CFR Part 58 Appendix E. Included are two tables: one for CO sites and one for PM sites. Certain sites have been found to have had their monitoring scale incorrectly designated. A discussion of the monitoring scale changes follows each table.

### *Carbon Monoxide Sites*

Carbon monoxide (CO) inlet probes should be at least 1 meter away, both vertically and horizontally, from any supporting structure or wall. For microscale sites the probe height must be between 2.5 and 3.5 meters, whereas for other scale sites the probe must be between 3 and 15 meters high.

A probe must have unrestricted airflow for at least 270 degrees, or 180 degrees if it is located on the side of a building. Obstructions must be a minimum distance away equal to twice the distance by which the height of the obstruction exceeds the height of the probe. Trees should not be present between the dominant CO source or roadway and the inlet probe.

The following is a list with definitions on monitoring site scaling;

*Microscale*—defines the concentrations in air volumes associated with area dimensions ranging from several meters up to about 100 meters.

*Middle Scale*—defines the concentration typical of areas up to several city blocks in size with dimensions ranging from about 100 meters to 0.5 kilometer.

*Neighborhood Scale*—defines concentrations within some extended area of the city that has relatively uniform land use with dimensions in the 0.5 to 4.0 kilometers range.

*Urban Scale*—defines the overall, citywide conditions with dimensions on the order of 4 to 50 kilometers. This scale would usually require more than one site for definition.

The following table (Table B-1) lists all CO monitoring sites in Anchorage and Fairbanks (including SPM) and how they fit the siting criteria from Appendix E of 40 CFR Part 58.

**Table B-1 CO monitoring sites in Anchorage and Fairbanks.**

Site Name	Monitoring Scale	Probe Distance from Wall (in meters)	Height (in meters)	Spacing from Obstructions	Spacing from Roadway (in meters)	Trees
Garden	Neighborhood	1 meter	3 meters	180 degrees unobstructed	7	Yes
Turnagain	Neighborhood	1 meter	3 meters	180 degrees unobstructed	12 meters from 500 VPD roadway	Yes
DHHS	Neighborhood	1 meter	3 meters	270 degrees unobstructed	28 meters	None
Parkgate	Neighborhood	1 meter	2.5 meters	180 degrees unobstructed	22 meters	None
Old Post Office	Microscale	1 meter	3 meters	180 degrees unobstructed	3 meters	None

In the 2000 network assessment the Garden Site was stated to be “micro” scale based on the probes vicinity to the roadway. After further review of Appendix E and Appendix D of EPA 40 CFR 58, EPA-450/3-75-077, and further discussion within DEC, we are now classifying this site as “neighborhood” scale.

### ***Particulate Matter ( $PM_{10}$ and $PM_{2.5}$ ) Sites***

For microscale sites particulate matter inlets must be between 2 and 7 meters from ground level. For other siting scales the probe must be between 2 and 15 meters high.

A sampler must have at least 2 meters separation from walls, parapets, penthouses, etc... A sampler must have unrestricted airflow for at least 270 degrees, or 180 degrees for street canyon sites. Obstructions must be a minimum distance away from the sampler with the separation equal to twice the distance by which the height of the obstruction exceeds the height of the sampler inlet.

Microscale sampler inlets must be located between 5 and 15 meters from the nearest traffic lane for traffic corridor sites, and between 2 and 10 meters for street canyon sites. The minimum separation distance between the probe and nearest traffic lane for middle, neighborhood, or urban scale sites depends upon the number of vehicles per day (VPD) that use the roadway according to a rather complicated table in Appendix E of 40 CFR Part 58. TableB-2 lists all PM monitoring sites in Alaska (including SPM) and how they fit the siting criteria from Appendix E of 40 CFR Part 58.

**Table B-2: PM monitoring sites in Alaska**

<b>Site Name</b>	<b>Monitoring Scale</b>	<b>Height (in meters)</b>	<b>Spacing from Obstructions</b>	<b>Spacing from Roadway (in meters)</b>	<b>Traffic (VPD)</b>	<b>Trees</b>
Garden	Neighborhood	10 meters	12m to 5m tall penthouse	10 meters	< 5,000	None
Tudor	Microscale	3.3 meters	None	7 meters	46,900	
DHHS	Middle	3 meters	None	28 meters	15,120	None
Parkgate	Neighborhood	6 meters	13m to 4m tall penthouse	44 meters	11,000	None
Harrison Court	Neighborhood	4 meters	> 8 meters	150 meters	Unknown, probably < 5,000	None
Palmer	Neighborhood	4 meters	> 8 meters	18 meters	Unknown, probably < 5,000	None
Wasilla	Neighborhood	4 meters	> 8 meters	20 meters	16,494	None
State Office Building	Neighborhood	6 meters	30 meters to 3.75 meter tall penthouse	20 meters	7,400	1 tree at 10 meters away
TAC (Peger Road)	Neighborhood	2.5 meters	> 60 meters	222 meters	7651	None
North Pole	Neighborhood	4 meters	>20 meters	~ 300 meter to Richardson Highway	10,400	Several to east > 30 meters
Floyd Dryden	Neighborhood	6 meters	Furnace flue @ 20 meters, 4 meter penthouse @ 15 meters	65 meters	12,770	12 meter tall @ 25 meters away

## APPENDIX C:

### *Network Site Summary*

State Code	County Code	Site ID	Parameter Code	POC	Method Code	Unit Code	Frequency	Parameter Description	Instrumentation	City Name	Street Address	Notes
02	020	0018	88101	1	117	105	1/3	Pm2.5 - Local Conditions	Partisol 2000	Anchorage	TRINITY CHRISTIAN CHURCH/3000 E 16TH	
02	020	0018	85101	1	063	105	1/6	Pm10 - Lc	Anderson Hi-Vol	Anchorage	TRINITY CHRISTIAN CHURCH/3000 E 16TH	
02	020	0018	81102	1	063	001	1/3	Pm10 Total 0-10um Stp	Anderson Hi-Vol	Anchorage	TRINITY CHRISTIAN CHURCH/3000 E 16TH	
02	020	0018	42101	1	054	007	cont	Carbon Monoxide	Thermo 48C	Anchorage	TRINITY CHRISTIAN CHURCH/3000 E 16TH	
02	020	0018	88501	3	732	105	cont	Pm2.5 - Local Conditions	Met One BAM	Anchorage	TRINITY CHRISTIAN CHURCH/3000 E 16TH	not in AQS
02	020	0018	88501	3	722	105	1/3	Pm2.5 Raw Data	Thermo TEOM	Anchorage	TRINITY CHRISTIAN CHURCH/3000 E 16TH	not in AQS
02	020	0044	81102	2	063	001	1/6	Pm10 Total 0-10um Stp	Anderson Hi-Vol	Anchorage	3335 E TUDOR RD ANCHORAGE AK 99508	
02	020	0044	88101	1	117	105	1/3	Pm2.5 - Local Conditions	Partisol 2000	Anchorage	3335 E TUDOR RD ANCHORAGE AK 99508	
02	020	0044	85101	1	063	105	1/6	Pm10 - Lc	Anderson Hi-Vol	Anchorage	3335 E TUDOR RD ANCHORAGE AK 99508	
02	020	0044	81102	1	063	001	1/3	Pm10 Total 0-10um Stp	Anderson Hi-Vol	Anchorage	3335 E TUDOR RD ANCHORAGE AK 99508	
02	020	0044	85101	1	079	105	cont	Pm10 - Lc	Thermo TEOM	Anchorage	3335 E TUDOR RD ANCHORAGE AK 99508	not in AQS
02	020	0048	42101	1	054	007	cont	Carbon Monoxide	Thermo 48C	Anchorage	3201 TURNAGAIN STREET	
02	020	0050	42101	1	054	007	cont	Carbon Monoxide	Thermo 48C	Anchorage	727 L STREET	
02	020	1004	85101	1	063	105	1/6	Pm10 - Lc	Anderson Hi-Vol	Eagle River	PARKGATE-EAGLE RIVER, EAGLE RIVER	
02	020	1004	42101	1	054	007	cont	Carbon Monoxide	Thermo 48C	Eagle River	PARKGATE-EAGLE RIVER, EAGLE RIVER	
02	020	1004	85101	1	063	105	1/6	Pm10 - Lc	Anderson Hi-Vol	Eagle River	PARKGATE-EAGLE RIVER, EAGLE RIVER	
02	020	1004	81102	1	063	001	1/3	Pm10 Total 0-10um Stp	Anderson Hi-Vol	Eagle River	PARKGATE-EAGLE RIVER, EAGLE RIVER	
02	020	1004	81102	1	063	001	1/6	Pm10 Total 0-10um Stp	Anderson Hi-Vol	Eagle River	PARKGATE-EAGLE RIVER, EAGLE RIVER	
02	090	0002	42101	1	054	007	cont	Carbon Monoxide	Thermo 48C	Fairbanks	FEDERAL BLDG/2ND & CUSHMAN	
02	090	0010	88101	2	117	105	1/6	Pm2.5 - Local Conditions	Partisol 2000	Fairbanks	STATE OFFICE BUILDING/675 7TH AVE	

State Code	County Code	Site ID	Parameter Code	POC	Method Code	Unit Code	Frequency	Parameter Description	Instrumentation	City Name	Street Address	Notes
02	090	0010	88101	1	117	105	1/3	Pm2.5 - Local Conditions	Partisol 2000	Fairbanks	STATE OFFICE BUILDING/675 7TH AVE	
02	090	0010	88501	3	732	105	cont	Pm2.5 - Local Conditions	Met One BAM	Fairbanks	STATE OFFICE BUILDING/675 7TH AVE	not in AQS
02	090	0010	88502	6	810	105	1/3	Pm2.5 - Local Conditions	Met One SASS	Fairbanks	STATE OFFICE BUILDING/675 7TH AVE	
							1/3	Pm2.5 - Local Conditions	Partisol 2000	Fairbanks	TAC/3175 PEGER RD	not in AQS
							1/3	Pm2.5 - Local Conditions	Partisol 2000	Fairbanks	TAC/3175 PEGER RD	not in AQS
							cont	Pm2.5 - Local Conditions	Met One BAM	Fairbanks	TAC/3175 PEGER RD	not in AQS
							1/3	Pm2.5 - Local Conditions	Met One SASS	Fairbanks	TAC/3175 PEGER RD	not in AQS
							cont	Pm2.5 Raw Data	Thermo TEOM	Fairbanks	TAC/3175 PEGER RD	not in AQS
							1/3	Pm2.5 - Local Conditions	Partisol 2000	North Pole	NORTH POLE ELEMENTARY SCHOOL 250 SNOWMAN LANE	not in AQS
							cont	Pm2.5 Raw Data	Thermo TEOM	North Pole	NORTH POLE ELEMENTARY SCHOOL 250 SNOWMAN LANE	not in AQS
							cont	Black Carbon	Magee Scientific Aethalometer	North Pole	NORTH POLE ELEMENTARY SCHOOL 250 SNOWMAN LANE	not in AQS
							1/3	Pm2.5 - Local Conditions	Met One SASS	North Pole	NORTH POLE ELEMENTARY SCHOOL 250 SNOWMAN LANE	not in AQS
02	110	0004	88501	3	732	105	cont	Pm2.5 Local Conditions	Met One BAM	Juneau	F DRYDEN JR HIGH/MENDENHALL LOOP RD	
02	110	0004	81002	1	116	105	1/6	Pm10 – Local Conditions	Partisol 2000	Juneau	F DRYDEN JR HIGH/MENDENHALL LOOP RD	
02	110	0004	81002	1	116	105	1/6	Pm10 – Local Conditions	Partisol 2000	Juneau	F DRYDEN JR HIGH/MENDENHALL LOOP RD	
02	110	0004	88101	1	117	105	1/6	Pm2.5 - Local Conditions	Partisol 2000	Juneau	F DRYDEN JR HIGH/MENDENHALL LOOP RD	
02	170	0008	81102	1	063	001	1/6	Pm10 Total 0-10um Stp	Anderson Hi-Vol	Mat-Su Valley	HARRISON COURT/BUTTE	
02	170	0008	88101	1	117	105	1/3	Pm2.5 - Local Conditions	Partisol 2000	Mat-Su Valley	HARRISON COURT/BUTTE	



## APPENDIX D:

### *Glossary*

**SLAMS:** State and local monitoring station

The SLAMS consist of a network of roughly 4000 monitoring stations nation-wide. Distribution depends largely on the needs of the State and local air pollution control agencies to meet their respective State Implementation plan (SIP) requirements. The SIPs provide for the implementation, maintenance and enforcement of the NAAQS in each air quality control region within a state. The State of Alaska monitoring network currently has 13 SLAMS sites for carbon monoxide and PM.

**NAMS:** national air monitoring station

The NAMS are a subset of the SLAMS network with emphasis on urban and multi-source areas. There are no current NAMS\*-designated monitors in the monitoring network

**SPMS:** special purpose monitoring station

Special Purpose monitoring stations are not permanently established and can be adjusted to accommodate changing needs and priorities for special studies needed by the State and local agencies. The SPMS are used to supplement the fixed monitoring network as circumstances require.

#### **Air Quality Index (AQI)**

The AQI is an index for reporting daily air quality and what associated health concerns the public should be aware of. The AQI focuses on health effects that might happen within a few hours or days of breathing polluted air. The AQI rates the air quality in 6 steps from good to hazardous.

**µg/sm<sup>3</sup>:** micro-gram per standard cubic meter.

**TEOM – FDMS:** Thermo Election Inc. Tapered Element Oscillating Microbalance Filter Dynamic Measurement System continuous monitoring sampler. This sampler can sample for coarse or fine particulate matter.

**BAM 1020:** Met-One Inc. Beta Attenuation Monitor model 1020 continuous monitoring sampler. This sampler can sample for coarse and fine particulate matter.

**Course particulate matter:** PM<sub>10</sub> – particulate matter less than or equal to 10 microns in size.

**Fine particulate matter:** PM<sub>2.5</sub> – particulate matter less than or equal to 2.5 microns